STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Strategy of Chemical Production**		Code **1010702211010720650**
Field of study **Chemical Technology**	Profile of study (general academic, practical) **(brak)**	Year /Semester **1 / 1**
Elective path/specialty **Organic Technology**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**
Cycle of study: **Second-cycle studies**	Form of study (full-time,part-time) **full-time**	
No. of hours Lecture: **2** Classes: **-** Laboratory: **-** Project/seminars: **-**		No. of credits **2**
Status of the course in the study program (Basic, major, other) **(brak)**	(university-wide, from another field) **(brak)**	
Education areas and fields of science and art **technical sciences** **Technical sciences**		ECTS distribution (number and %) **2 100%** **2 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Student has the necessary knowledge of both natural and synthetic raw materials, products and processes used in chemical technology, and of the directions of development. Student has a basic knowledge of chemical and process engineering.
2	**Skills**	Student can obtain information from literature, databases and other sources, can interpret the information, draw conclusions and formulate opinions. Based on general knowledge explains the basic phenomena associated with important processes in the chemical and process engineering.
3	**Social competencies**	Student can appropriately prioritize used to perform a particular task.

Assumptions and objectives of the course:

Obtaining knowledge of industrial chemistry.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Student has knowledge of complex chemical processes involving careful selection of materials, raw materials, methods, techniques, apparatus and equipment for chemical processes and the characterization of the resulting products. - [K_W03]
2. Student has an extended knowledge of environmental issues and technology purification processes associated with chemical - [K_W08]
3. Student has knowledge of selected aspects of modern chemical knowledge and aspects of industrial property. - [K_W14]

Skills:

1. Student has the ability to adapt the knowledge of chemistry and related disciplines to solve problems in the field of chemical technology and planning of new industrial processes - [K_U11]
2. Student is able to critically evaluate the practical suitability of the use of new developments in chemical technology. - [K_U16]
3. Student has the ability to multi-faceted technology project planning. - [K_U19]

Social competencies:

1. The student has formed awareness of the limitations of science and technology related to chemical technology, including the protection of the environment. - [K_K02]

Assessment methods of study outcomes

Written exam.

Course description

Designing processes. The research literature and patents. Industrial property. Treatment technology. The solvents in the organic synthesis (classical and alternative). Microwave techniques. Catalysis in technology (heterogeneous, homogeneous and enzymatic PTC). Enlarging the scale. Chemical and technological concepts. The selection process instruments and flow diagram. Fire and explosion hazards. Economics (profitability problems and calculations).

Basic bibliography:

1. L. Synoradzki, J. Wisialski, Projektowanie procesów technologicznych, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2006.
2. red. Andrzej Pyrża, Poradnik wynalazcy, UPRP, Warszawa 2009.
3. M. Ziółek, I. Nowak, Kataliza heterogeniczna: wybrane zagadnienia, Wydawnictwo UAM, Poznań.
4. G.C. Bond, Kataliza heterogeniczna. Podstawy i zastosowanie, PWN, Warszawa 1979.
5. F. Próchnik, Kataliza homogeniczna, PWN, Warszawa 1993.
6. T. Paryjczak, A. Lewicki, M. Zaborski, Zielona chemia, Wydawnictwo PAN, Łódź 2005.
7. B. Burczyk: Zielona chemia. Zarys, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2006.

Additional bibliography:

1. K. Weissermel, H.J. Arpe: Industrial organic chemistry, VCH, Weinheim, New York, Basel, Cambridge, Tokio, 1993.

Result of average student's workload

Activity	Time (working hours)
1. Lectures	30
2. Consultation	5
3. Exam	15

Student's workload

Source of workload	hours	ECTS
Total workload	50	2
Contact hours	35	1
Practical activities	15	1